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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,353	03/23/2004	Shunpei Yamazaki	740756-2721	3995

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EXAMINER	
HARRISON, MONICA D	
ART UNIT	**PAPER NUMBER**
2813	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/806,353	YAMAZAKI ET AL.	
	Examiner	Art Unit	
	Monica D. Harrison	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2-4-05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed February 4, 2005 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun (5,880,023) in view of Nishi et al (2003/0111666A1).

2. Regarding claim 1, Jun discloses a method for manufacturing a semiconductor device comprising the steps of: forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film which serves as a barrier as to be in contact with the insulating film and in the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum so as to be in contact with the first conductive film (Figure 3B, reference 22); and flattening a surface of the second conductive film by selectively performing a heat treatment under reduced pressure or in normal pressure (column 5, lines 28-36) however, Jun does not disclose the insulating film being organic.

Nishi et al discloses an organic insulating film (Figure 12B, reference 646).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

3. Regarding claim 2, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the heat treatment is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

4. Regarding claim 3, Nishi et al discloses wherein irradiation of light from ultraviolet to infrared by a lamp is used as the selective heat treatment (pg.4, paragraph 0058; pg.18, paragraph 0202).

5. Regarding claim 4, Nishi et al discloses wherein gas laser irradiation or solid-state laser irradiation which performs pulsed oscillation or continuous oscillation is performed ms the selective heat treatment (pg.18, paragraph 0202).

6. Regarding claim 5, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

7. Regarding claim 6, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

8. Regarding claim 7, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206),

9. Regarding claim 8, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, paragraph 0056).

10. Regarding claim 9, Jun discloses forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film which serves as a barrier as to be in contact with the film and in the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum so as to be in contact with the first conductive film (Figure 3B, reference 22); and flattening a surface of the second conductive film by selectively performing a heat treatment under reduced pressure or in normal pressure (column 5, lines 28-36) however, Jun does not disclose the insulating film being organic and forming a nitride film so as to be in contact with the organic insulating film and in the opening, and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion.

Nishi et al discloses the discloses the insulating film being organic (Figure 12B, reference 646) and forming a nitride film so as to be in contact with the organic insulating film and in the opening (Figure 12B, reference 647), and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion (Figure 12B, reference 647).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

11. Regarding claim 10, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the heat treatment is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

12. Regarding claim 11, Nishi et al discloses wherein irradiation of light from ultraviolet to infrared by a lamp is used as the selective heat treatment (pg.4, paragraph 0058; pg.18, paragraph 0202).

13. Regarding claim 12, Nishi et al discloses wherein gas laser irradiation or solid-state laser irradiation which performs pulsed oscillation or continuous oscillation is performed ms the selective heat treatment (pg.18, paragraph 0202).

14. Regarding claim 13, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

15. Regarding claim 14, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

16. Regarding claim 15, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206).

17. Regarding claim 16, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, Paragraph 0056).

18. Regarding claim 17, Jun discloses a method for manufacturing a semiconductor device comprising; forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film on the insulating film and in the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum on the first conductive film and in the opening portion (Figure 3B, reference 22); and flattening a surface of the second conductive film by performing a heat treatment under reduced pressure or in normal pressure (column 5, lines 28-36), however, Jun does not disclose the insulating film being organic.

Nishi et al discloses an organic insulating film (Figure 12B, reference 646).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

19. Regarding claim 18, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the heat treatment is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

20. Regarding claim 19, Nishi et al discloses wherein irradiation of light from ultraviolet to infrared by a lamp is used as the selective heat treatment (pg.4, paragraph 0058; pg.18, paragraph 0202).

21. Regarding claim 20, Nishi et al discloses wherein gas laser irradiation or solid-state laser irradiation which performs pulsed oscillation or continuous oscillation is performed ms the selective heat treatment (pg.18, paragraph 0202).

22. Regarding claim 21, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

23. Regarding claim 22, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

24. Regarding claim 23, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206),

25. Regarding claim 24, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, paragraph 0056).

26. Regarding claim 25, Jun discloses forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film which serves as a barrier as to be in contact with the film and in

the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum so as to be in contact with the first conductive film (Figure 3B, reference 22); and flattening a surface of the second conductive film by selectively performing a heat treatment under reduced pressure or in normal pressure (column 5, lines 28-36) however, Jun does not disclose the insulating film being organic and forming a nitride film so as to be in contact with the organic insulating film and in the opening, and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion.

Nishi et al discloses the discloses the insulating film being organic (Figure 12B, reference 646) and forming a nitride film so as to be in contact with the organic insulating film and in the opening (Figure 12B, reference 647), and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion (Figure 12B, reference 647).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

27. Regarding claim 26, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the heat treatment is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

28. Regarding claim 27, Nishi et al discloses wherein irradiation of light from ultraviolet to infrared by a lamp is used as the selective heat treatment (pg.4, paragraph 0058; pg.18, paragraph 0202).

29. Regarding claim 28, Nishi et al discloses wherein gas laser irradiation or solid-state laser irradiation which performs pulsed oscillation or continuous oscillation is performed ms the selective heat treatment (pg.18, paragraph 0202).

30. Regarding claim 29, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

31. Regarding claim 30, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

32. Regarding claim 31, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206).

33. Regarding claim 32, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, Paragraph 0056).

34. Regarding claim 33, Jun discloses a method for manufacturing a semiconductor device comprising; forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film so as to be in contact with the insulating film and in the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum so as to be in contact with the first conductive film (Figure 3B, reference 22); and flattening a surface of the second conductive film

by selectively performing a laser irradiation which performs pulsed oscillation or continuous oscillation under reduced pressure or in normal pressure (pg.18, paragraph 0202), however, Jun does not disclose the insulating film being organic.

Nishi et al discloses an organic insulating film (Figure 12B, reference 646).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

35. Regarding claim 34, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the laser irradiation is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

36. Regarding claim 35, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

37. Regarding claim 36, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

38. Regarding claim 37, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206),

39. Regarding claim 38, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, paragraph 0056).

40. Regarding claim 39, Jun discloses forming an insulating film (Figure 3A, reference 16); forming an opening portion in the insulating film (Figure 3A, reference 17); forming a first conductive film which serves as a barrier as to be in contact with the film and in the opening portion (Figure 3A, reference 18); forming a second conductive film including aluminum so as to be in contact with the first conductive film (Figure 3B, reference 22); and flattening a surface of the second conductive film by selectively performing a laser irradiation which performs pulsed oscillation or continuous oscillation under reduced pressure or in normal pressure (pg.18, paragraph 0202) however, Jun does not disclose the insulating film being organic and forming a nitride film so as to be in contact with the organic insulating film and in the opening, and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion.

Nishi et al discloses the discloses the insulating film being organic (Figure 12B, reference 646) and forming a nitride film so as to be in contact with the organic insulating film and in the opening (Figure 12B, reference 647), and patterning the nitride film so that a layer under the organic insulating film is exposed in the opening portion (Figure 12B, reference 647).

Since Jun and Nishi et al are both from the same field of endeavor, the purpose disclosed by Nishi et al would have been recognized in the pertinent art Jun.

It is obvious, at the time the invention was made, for one with ordinary skill in the art, to modify Jun with the teachings of Nishi et al for the purpose of the transmitting injected electrons which now can be performed with good efficiency.

41. Regarding claim 40, Jun discloses from the step of forming the first and second conductive film to the steps of selectively performing the laser irradiation is sequentially carried out without being exposed to atmosphere (column 5, lines 9-36).

42. Regarding claim 41, Nishi et al discloses the organic insulating film includes one kind selected from acryl, polyimide, polyamide, polyimidamide, epoxyacryl, benzocyclobutene, parylene and flare (pg.9, paragraph 0077).

43. Regarding claim 42, Nishi et al discloses the organic insulating film includes a skeleton structure with a bond of silicon (Si) and oxygen (O) and includes at least hydrogen in the substituent, or a film at least including a kind of a fluorine, an alkyl group, and aromatic hydrocarbon in the substituent (pg.5 thru pg. 9; pg. 18, paragraph 0204).

44. Regarding claim 43, Nishi et al discloses a film including titanium, tantalum, tungsten, or silicon is formed as the first conductive film (pg. 18, paragraph 0206),

45. Regarding claim 44, Nishi et al discloses forming a third conductive film over the second conductive film (Figure 12C, reference 657); and forming a film including one kind or plural kinds of element selected from germanium, tin, gallium, zinc, lead, indium, or scandium (pg. 4, paragraph 0056).

Response to Arguments

46. Applicant's arguments with respect to claim 1-44 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica D. Harrison whose telephone number is 571-272-1959. The examiner can normally be reached on M-F 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monica D. Harrison
AU 2813

mdh
May 16, 2005

Craig A. Thompson

CRAIG A. THOMPSON
PRIMARY EXAMINER